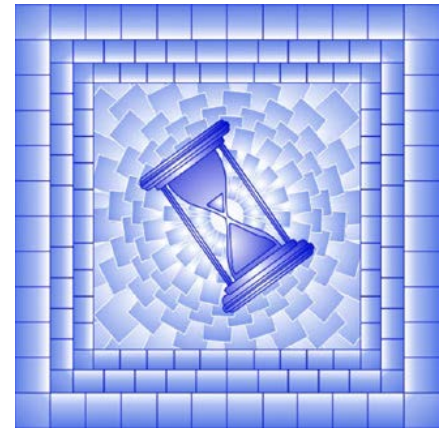


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Prices Analytical Series

Methodological Supplement for the Monthly Average Retail Prices Table



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Methodological Supplement for the Monthly Average Retail Prices Table

The table, [Monthly average retail prices for selected products](#) provides average monthly price estimates for a range of products commonly purchased by Canadian consumers.

The average prices in this table are calculated using scanner data (also known as transaction data) collected from Canadian retailers which offers a significant quality advantage over traditional in-store collection. Transaction data provide a comprehensive electronic record of the transactions made through a retailer's point-of-sale system by including prices from thousands of stores across the country, representing millions of weekly food prices and covering the majority of the Canadian grocery market.

Scanner or point-of-sale data are the highest quality price data available as they track actual prices paid by Canadians at the till, including sales and promotions where applicable, as well as product characteristics such as package size and quantity sold.

How to interpret average prices and the Consumer Price Index

Average prices are estimates of the average price paid by the consumer and can be used for comparing price levels of different items in the same month.

Average prices are not estimates of pure price change as they are not comparable over time due to factors including product rotation, quality and quantity changes, and shifting consumer preferences which all contribute to differences in prices from one month to another. Average prices do not necessarily compare the same product from month to month and should not be used for time series comparison.

Users should also use caution if comparing average prices across different provinces due to variations in brand, quality, and size among geographic areas.

Instead, the [Consumer Price Index \(CPI\)](#) should be used to measure pure price change. The CPI controls for product rotation, quality changes, quantity changes and shifting consumer preferences by reflecting price change only for the same or comparable item in the same outlet.

Furthermore, average price estimates may not move in the same direction or by the same magnitude as the CPI. The absence of a constant quality approach, and the use of different sample designs, data sources and calculation methodologies make the two measures not conceptually comparable.

Table 1
Features of the average prices and the Consumer Price Index

	Average prices	Consumer Price Index (CPI)
Type of measure	Average price estimates are measures of price levels.	Price indexes measure pure price change.
Frequency	Released monthly. Usually the first week of the second month following the observation period.	Released monthly. Usually in the third week of the month following the observation period.
Content updates	As consumer preferences change the contents of the table may, from time to time, be updated.	The CPI basket is updated every year to reflect changing household expenditures, and ensure the goods and services it contains are current. The characteristics of the representative products are reviewed and updated on a monthly basis to maintain comparability from one month to another. The published CPI products are updated accordingly so that the aggregated headline CPI remains an accurate measure of price change.
Data source	Retailer scanner (transaction) data.	Retailer scanner (transaction) data, online pricing (websites/banner store flyers) and administrative data.
Products included	Sample of commonly purchased consumer items.	All representative products under the food category.
Revisions	Subject to revisions.	Not revised.
Uses	Represents the average price paid by the consumer and can be used for comparing price levels of different items in the same month. Average prices should not be used as a time series for price comparison.	The CPI is a measure of pure price change, tracking products of constant quality, and holding all variables constant except for the month when prices are observed. This ensures the continuity of the CPI time series.

Source: Statistics Canada.

Product definition

Average prices are derived for products as defined by a specific size or quantity measure (e.g. 4 litres, 1 dozen) and exclude taxes. In most cases, a standard size or quantity can be easily identified as the measure of best fit for a particular product (for example, 1 dozen eggs). For certain products which are available to consumers in a wide variety of package sizes, prices for products within a set range¹ of package sizes are standardized before the average price calculation. Standardization is an accepted practice in the field of price measurement. It allows for the measurement of a broader group of product sizes which increases the robustness of a given sampled product category. For example, prices for blocks of cheese ranging in size from 400 g to 800 g are adjusted to represent a 500 g block of cheese, and are represented as such in the average prices table.

Average price calculation

The weighted average price calculation is done by first calculating the unit price for all unique items, calculating a unit weight based on units sold for that item, and then combining these into a weighted arithmetic average. This involves the following three step process.

In the first step, unit prices are calculated for all unique items belonging to a product category by dividing the total sales of that unique item by the number of units sold. If the product needs standardization because it is sold in a range of sizes, this is done by dividing the unit price (sales / units sold) by a standardization factor, which itself is calculated as the item's original size amount divided by the target size amount (see Table 2.2). This step is done across all store locations for each retailer.

In the second step, each unit price is then assigned a unit weight. If the item does not need standardization, the unit weight is calculated as the units sold for that item divided by the total number of units sold for that product category. Note that for the provincial level average price, this is the total units sold at the provincial level, and for the national level average price, this is the total units sold in all of Canada (territories included). If the item requires standardization, the units are first standardized by multiplying the units by the standardization factor (size amount / target size amount). Second, the standardized unit weights are calculated as the standardized units sold for that item divided by the sum of all standardized units sold for that product category.

In the third step, the final average price is calculated using a weighted arithmetic mean. This is done by multiplying unit prices by their unit weights (or standardized unit prices by their standardized unit weights) and summing all weighted unit prices at the provincial level as well as the national level to derive the final average price for a given product.

1. As a product's size may impact its price, acceptable size ranges are established using transaction data and expert judgment by commodity specialists.

Table 2**Example: Calculation of a standardized and non-standardized weighted average price****2.1 Non-standardized**

	Unique product	Sales	Units sold	Unit weight ¹	Unit price ²	Weighted unit price ³	Final weighted average price ⁴
Retailer A							
Apples - 1 kg	Gala apples (1 kg)	\$11,000	12,000	0.17	\$0.92	\$0.15	\$1.16
Apples - 1 kg	Fuji apples (1 kg)	\$15,500	14,000	0.19	\$1.11	\$0.22	...
Retailer B							
Apples - 1 kg	Gala apples (1 kg)	\$17,000	16,000	0.22	\$1.06	\$0.24	...
Apples - 1 kg	Fuji apples (1 kg)	\$40,000	30,000	0.42	\$1.33	\$0.56	...
Totals	...	\$83,500	72,000	1.00

2.2 Standardized

	Unique product	Sales	Units sold	Standardized units sold ⁵	Standardized unit weight ⁶	Unit price ⁷	Standardized unit price ⁸	Weighted standardized unit price ⁹	Final weighted standardized average price ¹⁰
Retailer A									
Block cheese- 0.5 kg	Cheddar cheese (500 g)	\$20,000	2,500	2,500	0.23	\$8.00	\$8.00	\$1.86	\$5.82
Block cheese- 0.5 kg	Mozzarella cheese (800 g)	\$13,500	2,000	3,200	0.30	\$6.75	\$4.22	\$1.25	...
Retailer B									
Block cheese- 0.5 kg	Cheddar cheese (600 g)	\$15,000	1,900	2,280	0.21	\$7.89	\$6.58	\$1.39	...
Block cheese- 0.5 kg	Mozzarella cheese (700 g)	\$14,250	2,000	2,800	0.26	\$7.13	\$5.09	\$1.32	...
Totals	...	\$62,750	8,400	10,780	1.00

... not applicable

1. Unit weight= units sold / sum of units sold.

2. Unit price= sales / units sold.

3. Weighted unit price= unit weight * unit price.

4. Final weighted average price= sum of weighted unit prices.

5. Standardized units sold= units sold * (size amount/target size amount).

6. Standardized unit weight= standardized units sold / sum of standardized units.

7. Unit price= sales / units.

8. Standardized unit price= unit price/(size amount/target size amount).

9. Weighted standardized unit price= standardized unit weight * standardized unit price.

10. Final weighted standardized average price= sum of weighted standardized unit prices.

Source: Statistics Canada.**Note to users**

Users are advised to exercise caution when comparing average prices for products across geographies as these may reflect brand and quality differences inherent to the various regions. Branded products such as yogurt and block cheese are more affected by such differences than homogenous products such as produce and meat. Further, shifting consumer preferences may also have an impact on price levels, and users should keep this in mind when attempting to make comparisons over time.